NIOSH recommends that health care facilities use safer medical devices to protect workers from needlestick and other sharps injuries. Since the passage of the Needlestick Safety and Prevention Act in 2000 and the subsequent revision of the OSHA Bloodborne Pathogen Standard, all health care facilities are required to use safer medical devices.

Safer Medical Device Implementation in Health Care Facilities

Sharing Lessons Learned

NIOSH has asked a small number of health care facilities to share their experiences on how they implemented safer medical devices in their settings. These facilities have agreed to describe how each step was accomplished, and also to discuss the barriers they encountered and how they were resolved, and most importantly, lessons learned.

Phase 2: Identify Priorities

Facility Description:
Large private, not-for-profit, academic medical center that includes over 950 hospital beds, twelve family health centers, two ambulatory surgical centers, a research institute and an education foundation. Over 2,000,000 outpatient visits and more that 50,000 hospital admissions each year. Facility employs over 1000 physicians representing approximately 120 specialties and subspecialties, approximately 3,000 nurses and a wide range of technical and support staff. Total number of employees is approximately 13,000.

Background and Review of Exposure Data

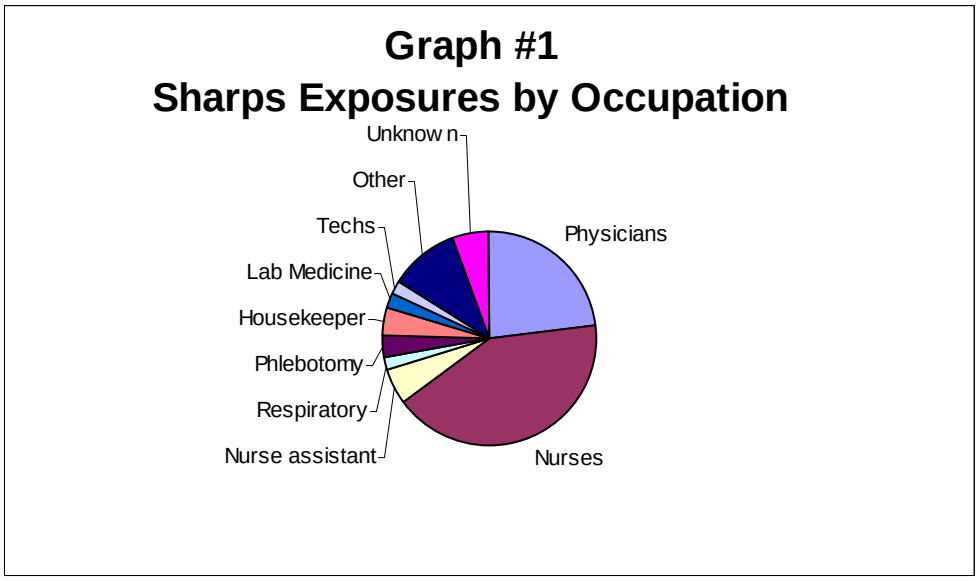
The first task of the sharps injury prevention team was to set priorities for the selection and implementation of sharps safety devices. This task required a review of safety devices currently in use, available literature and our institution's exposure data.

Several sharps safety devices were utilized in our institution such as a needleless intravenous system, blunt cannulas, syringes with vial access adapters and safety lancets. Compliance with the use of blunt cannulas was poor. This was confirmed by direct observation on various patient care units. Interviews with nursing staff revealed they were generally not interested in new safety products, particularly products that required a change in technique.

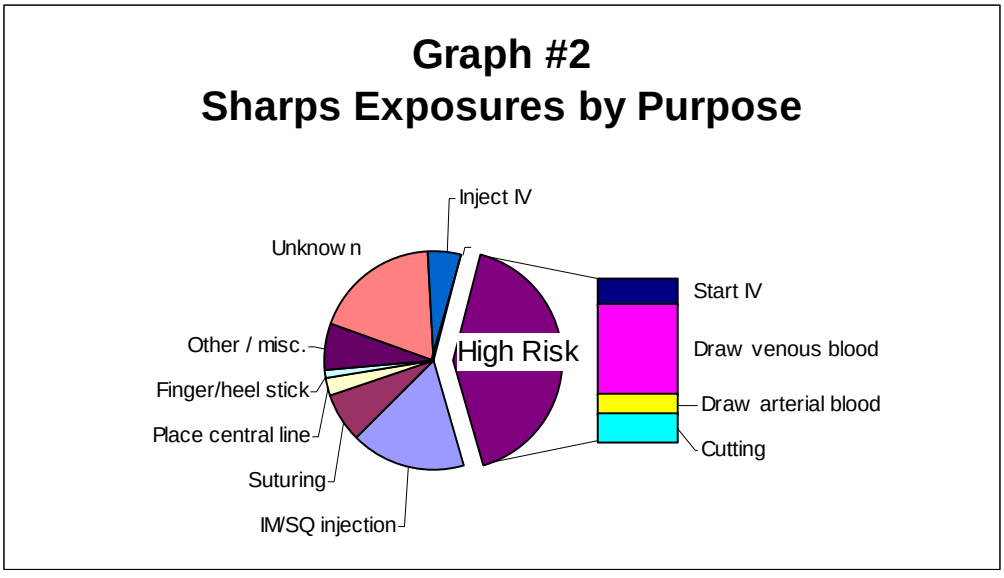
A wealth of literature from the mid-1990's has described the epidemiology of sharps injuries and the devices involved. It is also well documented that the risk of seroconversion after exposure to a bloodborne pathogen increases with large hollow bore needles and needles that have been in the patient's bloodstream. Given this information it was important to see if our institution had similar experiences to the published data.

Our sharps injury team leader is also responsible for the analysis and reporting of sharps injuries. Our institution was using a modified version of EPINet for data collection. This allowed us to compare our data to published data, recognizing that no two institutions are alike. The patient population served, volume and type of surgical and medical procedures, and staffing levels are a few factors that impact the use of sharps in any institution.

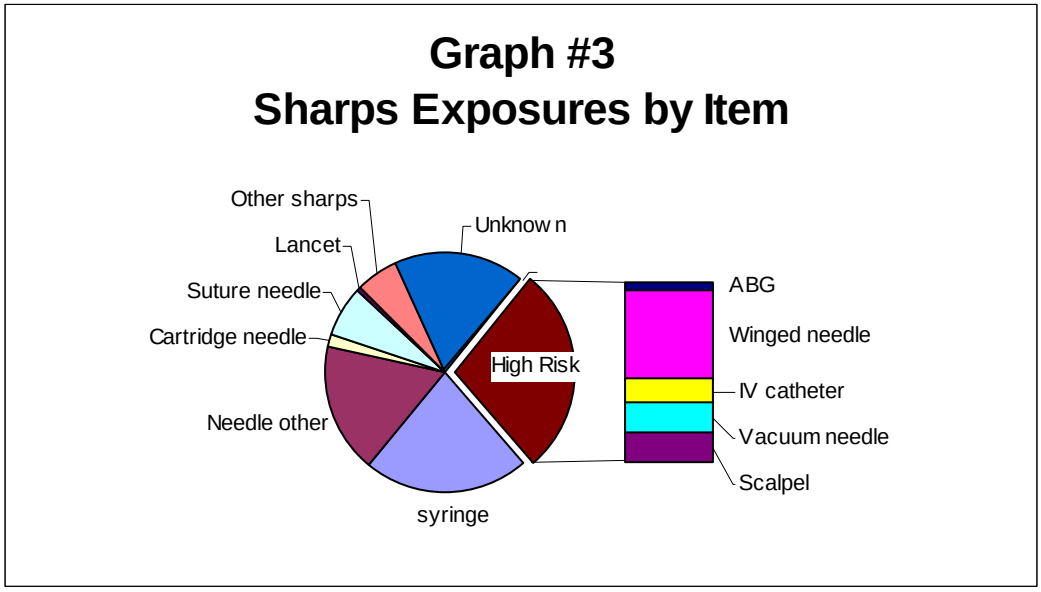
Our data demonstrated most exposures occurred to nurses, physicians and other groups who routinely used sharp devices. Non-clinical personnel (i.e., housekeepers) experienced frequent sharps exposures indicating a problem with sharps disposal (see graph #1).



Data on the purpose or use of the sharp device was divided into two categories. Items used in or in contact with the bloodstream and hollow bore needles (high risk) vs. items not used directly in the bloodstream or solid core needles (lower risk). Our data indicated a high percentage of exposures related to high-risk procedures (see graph #2).



Data on the devices used demonstrated disposable syringes and other assorted needles and sharps accounted for over half of the exposures. These injuries were less likely to be high risk for seroconversion. Approximately a quarter of the devices involved in exposures were high-risk devices (see graph #3).



Setting Priorities

Our goal was total sharps injury reduction. However, our first priority was reduction of high-risk sharp exposures. Review of our exposure data determined the devices involved in high-risk exposures and determined the direction for the evaluation and implementation process. Priority was given to the following devices:

- IV catheters
- Phlebotomy devices (winged needles, vacuum needles, blood tube holders, blood transfer devices)
- Arterial blood gas needles
- Scalpels

The next task was deciding the order for trial and implementation of high priority devices. The group brainstormed and team members gave visual demonstrations on how current sharps devices were used, locations of use, and who actually used them. Some devices had a single use (i.e., IV catheters), other devices could be used in a variety of ways (i.e., blood tube holders were used attached to stopcocks in the ICU, with butterfly needles on many nursing units and with straight vacuum needles by phlebotomy).

Our data and brainstorming sessions indicated that phlebotomy devices had the highest priority for conversion to safety. However, replacing these devices was going to be a complicated process involving many different items. In contrast, starting intravenous lines was a high-risk procedure simplified by the use of a single product throughout the institution. The team decided to start the safety conversion process with IV catheters. Working with a single product would allow the team to gain experience and establish

conversion processes and procedures that would then be implemented for the other safety devices.

The order of conversion for safety devices was loosely determined as follows:
- IV catheters
- Winged (butterfly) needles
- Blood transfer devices
- Phlebotomy needles / blood tube holders
- Blood gas syringes
- IM/SQ needles/syringes
- Disposable scalpels

Recommendations and lessons learned

Literature search
The Internet is an invaluable resource for literature review. An excellent web site is PubMed a service of the National Library of Medicine with access to MEDLINE.

Suggested search terms:
Sharps injury
Bloodborne pathogen exposures
Occupational exposures
Sharps safety devices

An excellent article to assist with a literature search:
KG Shojania, RN Olmsted *Searching the healthcare literature efficiently: From clinical decision-making to continuing education*. American Journal of Infection Control 2002;30:187-95.

Separate exposure data - high risk vs. low risk
If possible, separate your institution's exposure data into high risk vs. low risk items. If your institution does not have a detailed exposure database consider implementing an EPINet database. This database is available free of charge. Additional information available on the Internet at: http://www.med.virginia.edu/medcntr/centers/epinet/

Provide device demonstrations
Have your team observe a demonstration of phlebotomy and blood transfer procedures from a wide variety of settings. Some devices are used for a variety of reasons i.e., winged (butterfly) needles may be used for short-term intravenous infusion in one area and for phlebotomy in another. It is important for the team to understand how the safety devices will be used throughout the institution.

Investigate current device usage
The team assumed storeroom information would assist in recognition of devices used by clinical units. We thought all units used the same devices from the central storeroom. It was discovered that several units ordered devices directly from manufacturers. Our institution's storeroom data was not useful. The existing computer system was not

adaptable and could not give us unit-based information without investing considerable time to develop new queries. Consider utilizing your team to obtain information regarding sharps devices used on various units. Do not assume that only available storeroom items are in use.

Start conversion process with simple devices
Start your safety conversion process with a simple device that effects the whole institution. IV catheters are a reasonable place to start. Phlebotomy devices in a large varied institution can be difficult to standardize and require extensive research and training. Starting with a less complicated safety device is a good way for the team to gain experience and hopefully avoid some of the pitfalls along the way.

Suggested reading
J Culver. Preventing transmission of blood-borne pathogens: A compelling argument for effective device-selection strategies. American Journal of Infection Control. 1997;25:430-3.

J Jagger, M Bentley. Injuries from vascular access devices: High risk and preventable. Journal of Intravenous Nursing. 1997;20(6S),S33-S39.

G Pugliese. Reducing the risk of needlestick injuries: How far have we come? Infection Control Today. 1997;November, 16-25.

Estimated staff hours involved during the priority setting phase

Type of Staff	Hours Spent on Phase 1
Management	10
Administrative	16
Staff	12
Total	**38**